OWNERS MANUAL

**CRYSTEEL'S** 

LB407 & LB507

TRUCK HOIST

MOUNTING AND OPERATING INSTRUCTIONS



BOX 178 / HWY 60 E LAKE CRYSTAL, MINNESOTA 56055-0178 TELEPHONE 507-726-2728 OUT OF MN 800-533-0494

DATE PURCHASED		
HOIST SERIAL NUMBER	-	
CYLINDER SERIAL NUMBER		<u>-</u>
PUMP SERIAL NUMBER		
DEALER		<del>-</del>
ADDRESS		
PHONE	<u>,</u>	
·		

### **OPERATION AND USE**

- 1. Engage PTO from cab and adjust engine speed to fast idle.
- 2. To raise the hoist, press down on the knob of the hoist control lever and pull the lever back. To hold the body in any position, return the hoist control lever to its center detent position. To lower the hoist, press down on the knob of the hoist control lever and push the lever forward. Return the hoist control lever to its center detent position when not in use.
- 3. Cycle the hoist several times to remove air from the cylinder and hydraulic lines.
- 4 It is advisable to run the PTO to "power down", or lower, the hoist because this will act as a hydraulic lock to hold the hoist in the lowered position. It is not necessary to do this, however, because the reservoir has sufficient capacity whether or not the hoist is powered down. You will benefit from the advantages of the double acting hoist only if you power it down.
- To make use of the hydraulic lock feature, place the hoist control lever in the center detent position after the hoist is powered down. This places the pressure on the valve, where it belongs, not on the pump.
- 6. DO NOT LEAVE THE PTO IN GEAR WHILE TRANSPORTING. THIS WILL CAUSE SEVERE DAMAGE TO THE HYDRAULIC PUMP AND/OR PTO.
- 7. The hydraulic system should be drained, flushed and refilled with proper hydraulic fluid at regular intervals. CAUTION: NEVER use hydraulic brake fluid in the hydraulic system.

# SOME DO'S AND DON'T'S FOR SAFETY AND LONG SERVICE

- 1. Use the proper hydraulic fluid. KEEP IT CLEAN. Remember to change it regularly.
- 2. Lubricate all grease fittings at regular intervals.
- 3. ALWAYS carefully block up the body, using the body prop, before working under it.
- 4. Do not "race" the engine when operating the hoist.
- 5. Do not load the hoist beyond its capacity.
- 6. Operate the hoist on level ground only.
- 7. Do not drive the truck with the hoist raised, always lower the hoist.
- 8. DO NOT tamper with the hydraulic relief valve. This will void the warranty. It can cause severe damage to the hoist and cylinder.
- 9. Never leave the PTO in gear while transporting. It will ruin the hydraulic pump.
- 10. Check all bolts and set screws regularly. Keep them tight.

#### **FOREWORD**

Crysteel's LB407 and LB507 Hoists are designed and intended for use on single-axle trucks with cab-to-axle dimensions of 60 to 132 inches and body lengths of 8 to 14 feet.

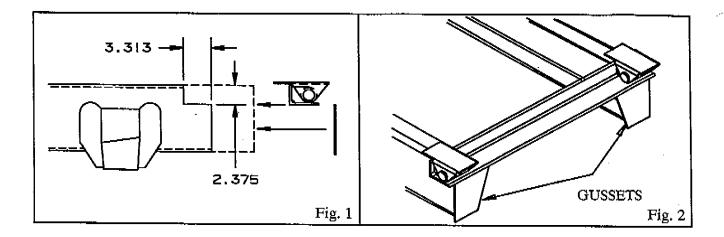
This manual contains information necessary for the proper installation and operation of Crysteel's Model LB407 and LB507 Hoists. Study it carefully before attempting to install or use the hoist. With proper installation and maintenance, your Crysteel LoBoy Hoist will give many years of trouble-free service. When ordering parts, be sure to give the serial number of the hoist, cylinder, and pump. The serial number of the hoist is stamped into the hoist frame near the base end of the cylinder. The serial number of the cylinder is stamped on the barrel of the cylinder near the base. The serial number of the pump is found on the plate on the side of the pump. For future reference, copy these numbers **NOW** in the space provided on page 1. Order parts by number and description as given in the parts listing in this manual.

### KEEP THIS MANUAL IN A SAFE PLACE FOR FUTURE REFERENCE

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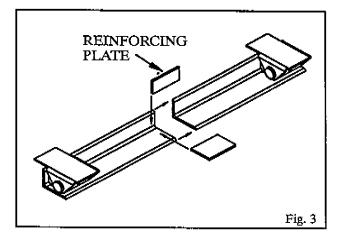
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### **INSTALL REAR HINGE**



The rear hinge should be located as close behind the rear spring shackle as possible. Mark the truck as shown in Fig. 1. Notch the truck frame as marked. Place the rear hinge in the notch on the truck frame as shown in Figs. 1 and 2 and clamp it in place. Make sure the rear hinge is centered on and square with the truck frame. Securely weld the rear hinge to the truck frame. Place the truck frame gussets against the bottom of the rear hinge frame angle and against the end of the truck frame. Securely weld the gussets to the rear hinge angle and to the truck frame. Trim the bottom edge of the gusset as needed.

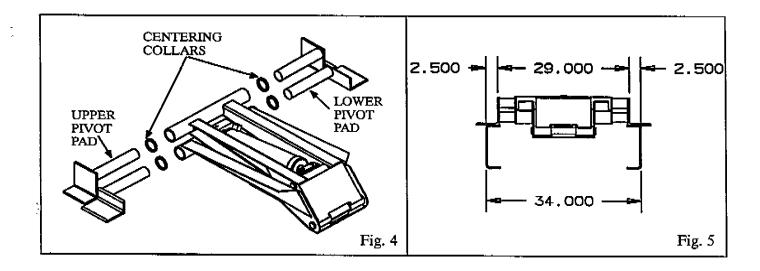
The rear hinge is designed to fit trucks with 34" frames; it needs to be narrowed when trucks with narrower frames are used. To make the rear hinge narrower, cut the rear hinge frame angle between the pivots as shown in Fig. 3, remove a section and weld the two halves together. Reinforce the welded joint with plates (not supplied.)



#### INSTALL HOIST PIVOT PADS

The LB407 and LB507 hoists have separate hoist pivot pads to allow the hoist to be installed on trucks with narrower frames (down to 29 inches). Centering collars are supplied with these hoists to center the hoist on the truck frame. These collars and pivot pads will need to be added to the hoist frame before installing the hoist on the truck frame. Place a centering collar on the shaft of each of the hoist pivot pads and insert the hoist

pivot pads into the hoist cross tubes as shown in Fig. 4. Measure the truck frame width, subtract 5" and adjust the hoist pivot pads to fit. For example, if the truck frame measures 34", subtract 5" and set the hoist pivot pads at 29". (See Fig. 5.) Be sure the hoist is centered between the pivot pads. Securely weld the centering collars to the hoist pivot pad shafts.



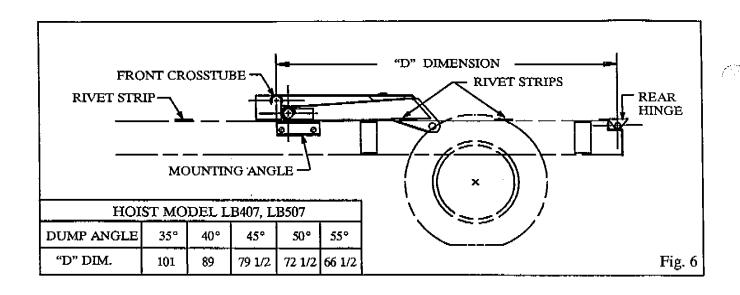
#### LOCATE HOIST

Determine where to mount the hoist on the truck frame. Please refer to the chart in Fig. 6 for the relationship between dump angle and "D" dimension. Measure forward from the center of the rear hinge pin and mark, on the truck frame, the location of the front crosstube of the hoist frame. Place the hoist on the truck frame and clamp the hoist pivot pads to the truck frame. The hoist should be level with the truck frame. If the center hinge end of the hoist is too high, relocate the hoist. If the center hinge end of the hoist is too low, install spacers (not supplied) on the crossmember in the truck frame under the hoist. Make sure the hoist frame is centered on and square with the truck frame. Clamp a hoist mounting

angle to the lower hoist pivot pad and to the outside of the truck frame (one on each side) and mark the truck frame for drilling.

CAUTION: BE CAREFUL OF BRAKELINES, WIRING, ETC. INSIDE THE TRUCK FRAME WHEN DRILLING THE TRUCK FRAME.

Drill 21/32 diameter holes in the truck frame using the hoist mounting angles as guides. Bolt the mounting angles to the truck frame using  $5/8 \times 2$  cap screws and hex lock nuts. Securely weld the lower hoist pivot pads to the mounting angles. Remove the clamps.



#### INSTALL PUMP

The gear pump has an SAE 'A' mounting configuration, a 9 tooth splined shaft and a two-bolt mounting flange, and is assembled for counterclockwise rotation. Note: This pump will mount directly to Chelsea's output type 'XE' or Muncie's output type 'R'. Crysteel Manufacturing recommends a PTO ratio of 100-120%. This assures a minimum pump operating speed of 600 RPM.

CHECK THE ROTATION OF THE PTO! If it is opposite of the engine, then the pump can be used as it is. If the PTO rotation is the same as the engine, then the pump will need to be reversed. (See instructions included with the pump.) Bolt the gear pump to the PTO output flange using 3/8 x 1" cap screws and lock washers.

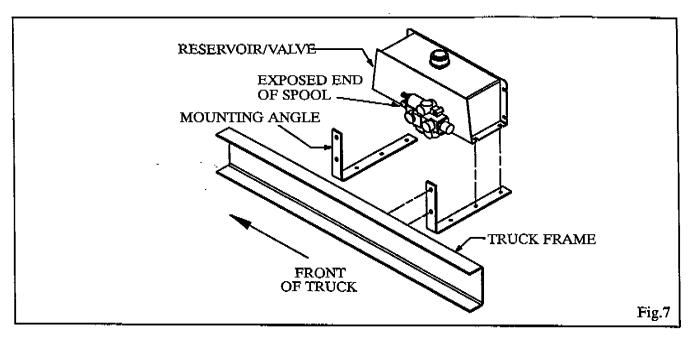
#### INSTALL RESERVOIR / VALVE

Determine which side of the truck to mount the reservoir/valve assembly. The same side as the PTO opening on the transmission would be ideal. Using 3/8 x 1" cap screws, flat washers, lock washers and hex nuts, bolt the reservoir mounting angles to the reservoir/valve assembly so the exposed end of the valve spool is toward the cab (See Fig. 7). This makes it much easier to connect the valve control cable to the valve. Place this assembly against the outside of the truck frame on the same side as the pump. Mark the truck frame for drilling using the mounting angles as guides. Make sure there is enough clearance for hot ex-

haust pipes. THE ENGINE EXHAUST MUST NEVER BLOW DIRECTLY ONTO THE RESER-VOIR/VALVE ASSEMBLY.

CAUTION: BE CAREFUL OF BRAKELINES, WIRING, ETC. INSIDE THE TRUCK FRAME WHEN DRILLING THE TRUCK FRAME.

Drill 17/32" holes in the truck frame and bolt the reservoir/valve assembly in place using  $1/2 \times 1$  3/4" cap screws, lock washers and hex nuts.

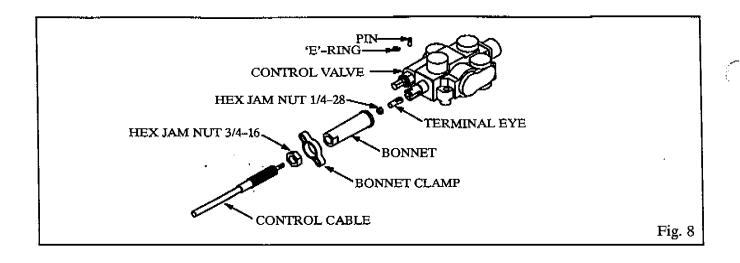


#### INSTALL HOIST CONTROL

Mount the Hoist Control decal on the pedestal taking care to align the holes for the PTO cable and indicator light. Temporarily assemble the valve control head to the pedestal using 5/16 x 2 1/2 machine screws and hex nuts. Place this assembly on the floor of the cab. The pedestal and valve control should angle forward. This makes it convenient for the operator to pull the hoist control lever back to raise the hoist. Make sure there is enough room to operate the valve control and gear shift lever and to adjust the seat. Check below the floor for obstructions and cable routing. Relocate the valve control if necessary. Mark the floor using the pedestal as a template and drill 11/32" holes for the mounting screws and a 3/4" hole for the control cable. Assemble the control cable to the valve control head and assemble the valve control head and cover to the pedestal using 5/16 x 2 1/2 machine screws and hex lock nuts. Insert the control cable through the hole in the floor and mount the pedestal to the floor using 5/16 x 1/2 hex head cap screws, clamping plate (under the floor) and hex lock nuts. Make sure the valve control lever is in its center detent position. Keep the control cable away from hot exhaust pipes and rotating drive shafts. The control cable should not

have any sharp bends or kinks in it (these will make the control harder to operate).

Install the 3/4" hex jam nut onto the valve end of the control cable and turn it past the threads. Insert the end of the cable through the bonnet clamp. Install the bonnet onto the control cable and turn it past the threads also. Install the 1/4" hex jam nut and terminal eye on the core rod of the cable; lock the terminal eye to the core rod of the cable using the hex jam nut. Place the terminal eye in the slot of the valve spool; insert the short pin through the valve spool and terminal eye and secure it in place with the 'E' ring. Thread the bonnet onto the end of the cable so it firmly touches the end of the valve. (Do not over- or under-tighten the bonnet as either would move the valve spool out of its neutral position.) Remove two cap screws from opposite corners of the seal retainer plate. Slide the bonnet clamp onto the bonnet and secure it to the valve using the 1/4 x 1 1/4 cap screws, lock washers and flat washers. Lock the bonnet to the cable using the 3/4" hex jam nut. (See Fig. 8.)

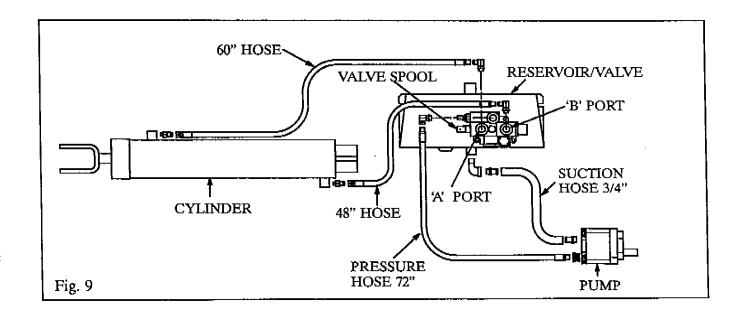


#### INSTALL HOSES

Study Fig. 9 very carefully before connecting hoses. Install a 90° street elbow and a 3/4" hose barb in the suction port on the bottom of the reservoir. Install a 1 1/16 ORB x 3/4" hose barb in the suction port of the pump and install a 3/4" ID suction hose. Secure the suction hose in place using hose clamps. Install a 1 1/16 ORB x 3/8 NPT adapter and a 3/8 NPT 90° swivel adapter in the 'IN' port of the control valve and a 7/8 ORB x 3/8 NPT adapter in the pressure port of the pump. Connect a 72" long 3/8" hose between the pump and the valve.

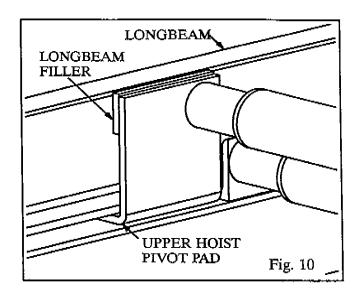
Install 90° adapters in the work ports of the control valve and straight adapters in the ports on the cylinder. Connect the shorter 3/8" hose from the 'B' port on the control valve to the base end port on the cylinder; connect the longer 3/8" hose from the 'A' port to the rod end port. This will raise the hoist when the control lever is pulled back and lower it when pushed forward.

NOTE: The 'A' port is the 'power-down' port and has a pressure of only 500-1000 PSI; the 'B' port has full system pressure.



### MOUNT BODY

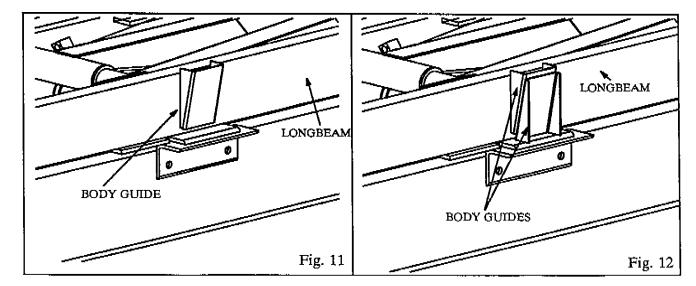
It is recommended that the body be painted before it is mounted on the truck. Place the body in position on the truck with three inches of clearance behind the cab. Use the rivet strip mounting pads between the longbeams and the truck frame. Use three on each side, spaced as shown in Fig. 6 on Page 5. Weld them to the longbeams. Align the body longbeams carefully with the truck frame. Securely weld the longbeams to the rear hinge brackets and to the upper hoist pivot pads. On the inside of the longbeams, securely weld the longbeam fillers to the top of the upper hoist pivot pads and to the top flange of the longbeam channels as shown in Fig 10.



#### INSTALL BODY GUIDES

The four body guides are all identical. Weld one to each longbeam as shown in Fig. 11, with the wide end of the body guide at the top and centered over the truck mounting brackets. Now weld the other pair of body guides to the truck

mounting brackets, and tight against the first body guides as shown in Fig. 12. There should be NO sideplay between body guides when the truck body is in the lowered position.



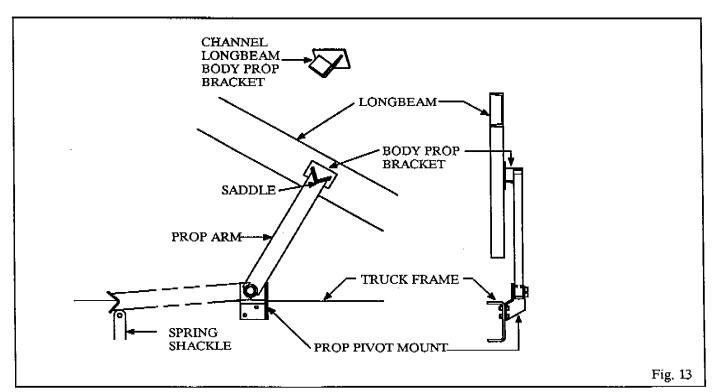
#### INSTALL BODY PROP

The body prop is designed and intended to support an *EMPTY* truck body in the raised position. Using the body prop permits service work to be performed safely beneath a raised body. It is mounted on the outside of the truck frame on the drivers side.

- 1. Raise the body to the desired height and brace it securely before beginning installation.
- 2. Raise the prop arm to a free standing position by allowing the prop arm to rest against the rear flange of the prop pivot.
- 3. Place the longbeam bracket assy in the body prop saddle. Raise or lower the body as needed to position the bracket on the outside of the longbeam where it will not interfere with the body prop when it is in the stored position and the body is down. Securely weld this bracket assy to the body (See Fig. 13.)
- 4. To operate the body prop, raise the body to the desired height, shut off all power, raise the prop arm to a free standing position. Lower the body slowly until the longbeam bracket contacts the prop arm saddle.

#### DO NOT POWER HOIST DOWN!

5. To place the body prop in the storage position, raise the body to clear the body prop saddle, lower the body prop to the storage position and lower the body.



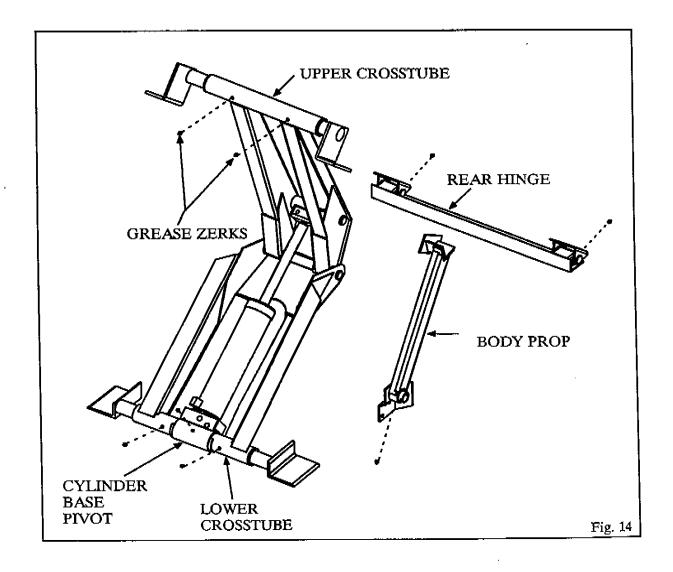
#### INSTALL GREASE ZERKS & LUBRICATE HOIST

Install grease zerks on the hoist and lubricate the hoist in the following locations:

Lubricate all fittings and the control cable at regular intervals, at least each time the truck chassis is lubricated. There are extremely highforces on the bearings surfaces within the hoistframe. It pays to be generous in lubricating the hoist to insure proper operation and long life.

The center hinge and the cylinder crosshead do not need to be greased. These pivot points are equipped with self lubricating composite bearings that do not need lubrication.

ONE OF THE MOST COMMON REASONS FOR HOIST PROBLEMS IS FAILURE BY THE OPERATOR TO LUBRICATE THE HOIST.

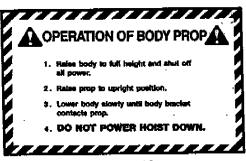


#### INSTALL DECALS

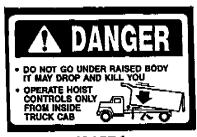
After the hoist and body have been mounted, install the decals in the following locations:

- 1. 400640 Mount in cab near the hoist control.
- 2. 400719 Mount on the body longbeam near the body prop.
- 3. 400661 Mount on the body prop arm.
- 4. 401576 Mount on the out side of the body longbeam, near the front (one on each side).
- 5. 400643 Mount on the body longbeam on the driver's side.
- 6. 401577 Mount in the cab in a prominent location.
- 7. 400642 Mount in the cab in a prominent location.

See the following illustrations for decal identification.



400719



401576

DOUBLE ACTING VALVE OUT - RAISE; CENTER - HOLD; IN - LOWER TO USE HYDRAULIC LOCK-DOWN

CONTINUE POWER DOWN UNTIL RELIEF VALVE BY-PASSES; THEN SET IN "HOLD" POSITION.

400640



400643



401577

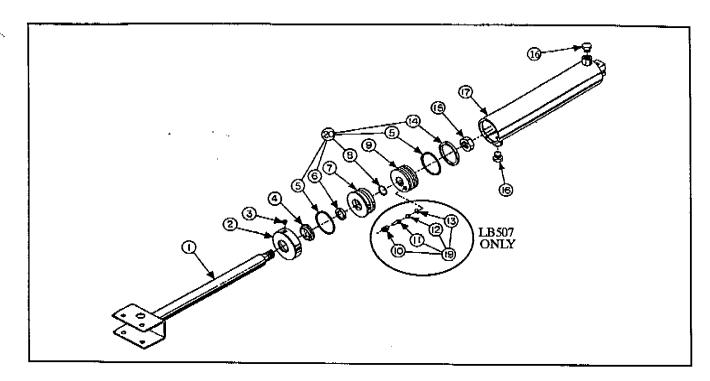


400642



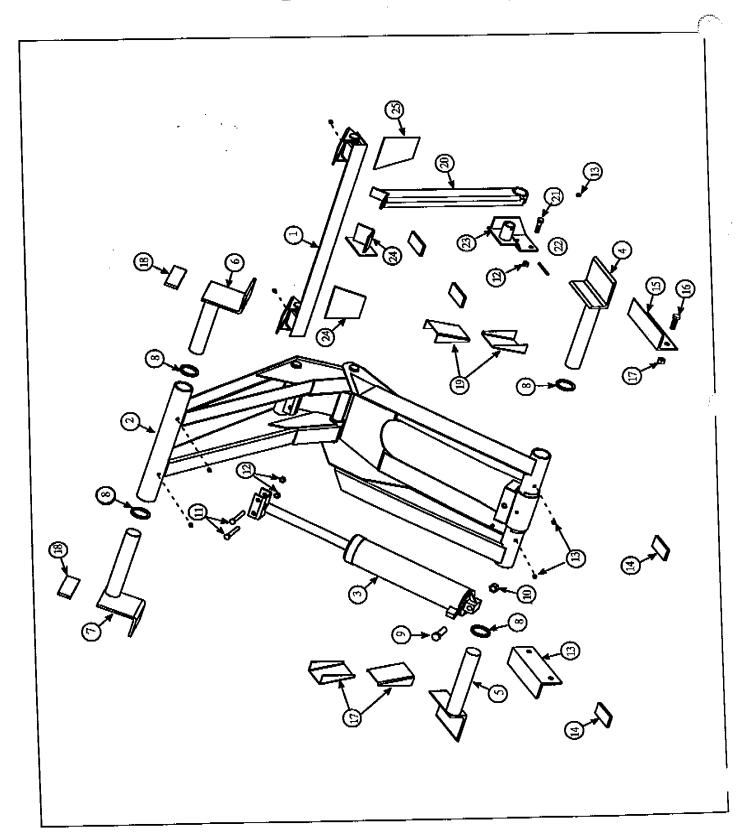
400661

### CYLINDER PARTS LIST



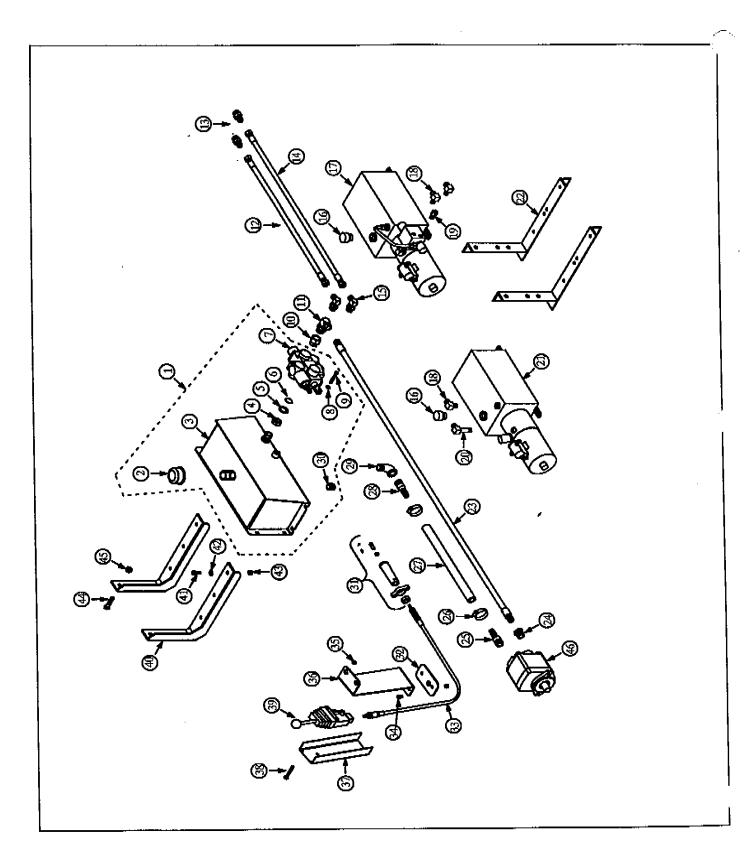
	LB 407	LB507	CYLINDER PARTS LIST	
ITEM	PART N	UMBER	DESCRIPTION	QTY
1.	105540	110306	Shaft Assy	1
2.	<u>105541</u>	104293	Cylinder Cap Assy	1
3.	400149	400149	Set Screw 1/4 x 3/16	1
4.	401133	400913	Wiper	1
5	400263	400254	O-Ring	2
6.	401132	400253	Polyseal	2
7.	206279	202469	Cylinder Head	1
8.	401131	400255	O-ring	1
9.	206755	202461	Piston	1
10.		400978	*Bypass Valve Body	1
11.	<del></del>	400979	*Bypass Valve Pin	1
12.		<u>40101</u> 7	*O-ring 7/16	1
13.		400013	*Bypass Vlave Ball	1
14.	400262	400252	Polyseal	1
<u>1</u> 5.		401370	Hex Jam Nut	1
16.	400422	400422	Plug 3/4-16	2
17.	105539	110305	Outer Tube Assy	1
18.		105185	Kit Bypass Valve (items 14-17)	· ''
19.	107958	107960	Seal Kit (includes * items)	

# HOIST PARTS LISTS



### SERVICE PARTS FOR HOIST

	LB407	LB507		
ITEM		UMBER	DESCRIPTION	QTY.
1.	108129	118129	Assy Rear Hinge	1
2.	118370	120459	Assy Frame	1
3.	105528	110304	Assy Cylinder	1
4.	118383	118383	Assy Lower Pivot-L	1
5.	118384	118384	Assy Lower Pivot-R	1
6.	118385	118385	Assy Upper Pivot-L	1
7.	118386	118386	Assy Upper Pivot-R	1
8.	224415	224415	Hoist Mount Collar	4
9.	401237	401237	Screw Cap 3/4 x 4	1
10.	401226	401226	Hex Lock Nut 3/4-10	1
11.	401140	401140	Screw Cap 1/2 x 3 1/4	2
12.	401316	401316	Hex Lock Nut 1/2-13	2
13.	400103	400103	Grease Zerk 1/8 NPT	4
14	200900	200900	Longbeam Filler (3/8 x 2 x 6)	8
15.	201422	201422	Angle, Mounting	2
16.	402374	402374	Screw Cap 5/8 x 2NC	2
17.	401582	401582	Hex Lock Nut 5/8-11	4
18.	200892	200892	Longbeam Spacer (3/8 x 2 x 4)	4
19.	201415	201415	Body Guide	6
20.	101220	101220	Body Prop Leg Assy	4
21.	400105	400105	Screw Cap 1/2 x 2	1
22.	400220	400220	Pin Spring 1/4 x 3	2
23.	104190	104190	Body Prop Mount Assy	
24.	101221	101221	Body Prop Bracket Assy	1
25	206769	206769	Rear Hinge Gusset	2



		RESERVOIR PARTS	
ITEM	PART #	DESCRIPTION Q	ΓY.
1.	116643	Reservoir/Valve Carton (includes Items 2-9, 30)	1
2.	400764	Breather Cap	1
3.	116790	Reservoir Assy	1
4.	402092	Nut Hex Jam 1 1/16-12	1
5.	402093	Washer 1 1/16 Cone	1
6.	401094	O-Ring .924 ID x .116 CS	1
7.	402065	Control Valve	1
ጸ.	400165	Lock Washer 5/16"	_1
9.	402115	Cap Screw 5/16-18 x	1
10.	217489	Adapter 1 1/16-12ORBM x 3/8 NPTF	1
11.	401453	Swivel Adapter 3/8 NPT	1
12.	402490	Hose 3/4 JIC x 48 SF	1
13.	402789	Adapter 3/8 NPTM x 3/4 JICM	2
14.	402517	Hose 3/4 ЛС x 60SF/SF	1
15.	402486	Adapter 7/8 ORBM x 3/4 JICM 90°	2
16.	400776	Breather Cap, Electric	1
17.	401066	Pump, Electric PB D/A	1
18.	402510	Adapter 3/4 JICM x 1/4 NPTF 90°	2
19.	402511	Adapter 1/4 NPTM x 1/4 NPTF	1
20.	402509	Adapter 3/4 JICM x 1/4 NPTM, Extra Long 90°	1
21.	401223	Pump, Electric – S/A, PB	1
22.	100174	Pump Angle Assy	2
23.	401444	Hose 3/8 NPT x 72"	1
24.	400478	Adapter 7/8 ORBM X 3/8 NPTF	1
25.	402146	Hose Barb 1 1/16 ORB x 3/4"	1
26.	401441	Hose Clamp #24 1 1/16" to 2"	2
27.	210604	Suction Hose 6' 3/4" ID	1
28.	401447	Hose Barb 3/4 NPT x 3/4	1
29.	402144	Pipe Elbow 3/4 90°, Street	1
30.	400405	Pipe Plug 3/4", Magnetic	1
31.	402127	Valve Connection Kit	1
32,	225127	Plate Clamping - Pedestal	1
33.	402122	Cable, Valve Control – 96"	1
34.	402415	Cap Screw 5/16 NC x 1/2	2
35.	401240	Hex Lock Nut 5/16-18	5
36.	223143	Pedestal Bracket - Wescon	1
37.	223144	Pedestal Channel	1
38.	402154	Machine Screw 5/16-18 x 2 1/2	2
39.	402120	RVC w/Center Detent	1
40.	120031	Reservoir/Valve Assy Mount	2
41.	400121	Hex Head Cap Screw 3/8 x 1	6
42.	400164	Flat Washer 3/8	4
43.	402038	Hex Lock Nut 3/8-16	4
44.	400105	Hex Head Cap Screw 1/2 x 2	4
45.	401316	Hex Lock Nut 1/2–13	4

#### **SPECIFICATIONS**

NTEA Class	Hoist Model	Cylinder Bore–Stroke–Shaft	Operating Pressure	Mounting Height	Minimum Longbeam Height	Body Length
B	LB407	4"-15 3/8"-1 1/2"	3250 PSI	6 1/4"	6"	8'-12'
C	LB507	5"-15 3/8"-2"	3250 PSI	6 1/4"	6"	8'-14'

#### CAPACITY CHART

				HOIST MODEL				
Body Length	Cab–to– Axle	Overhang	40°	LB407 45°	50°	40°	LB507 45°	50°
8'	60"	6"	8.0	7.1	6.4	12.6	11.1	10.1
9,	60"	18"	9.4	8.3	7.5	14.7	13.0	11.8
	72"	6"	7.0	6.2	5.6	11.0	9.7	8.8
10'	72"	18"	8.0	7.1	6.4	12.6	11.1	10.1
	84"	6"	6.2	5.5	5.0	9.8	8.7	7.8
12'	84"	30"	8.0	7.1	6.4	12.6	11.1	10.1
	96"	18"	6.2	5.5	5.0	9.8	8.7	7.8
	108"	6"	5.1	4.5	4.1	8.0	7.1	6.4
14'	108"	30"	N/A	N/A	N/A	9.8	8.7	7.8
	120"	18"	N/A	N/A	N/A	8.0	7.1	6.4
	132"	6"	N/A	N/A	N/A	6.8	6.0	5.4

NOTE: Capacity is based on water-level load and includes body weight.

#### CAPACITY FORMULA

To calculate the capcity of the LB407 or the LB507 hoist for applications not shown in the capacity chart, use the following formula:

- 1 Measure the distance in inches from the center of the rear hinge pin to the center of the body. Call this dimension "A".
- 2. Measure the distance in inches from the center of the rear hinge pin to the center of the front hoist pivot, (See Fig. 6 on page 5.) Call this dimension "D".
- 3. For the LB407: multiply "D" by 7.57 and divide by "A". For the LB507: multiply "D" by 11.8 and divide by "A".
- 4. The result is the water-level load capacity in thousands of pounds and includes the body weight.

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# - NOTES -

## SPECIALLY DESIGNED - WITH QUALITY IN MIND

## WARRANTY

- Crysteel Manufacturing, Inc. warrants its products for a period of one year from date of purchase.
- The warranty provides that our products must perform satisfactorily or we will repair, replace or refund the purchase price at the option of the purchaser. Hydraulic pumps, valves, hoses and other purchased parts are covered by the warranties of their respective manufacturers.
- Any parts returned tor Crysteel Manufacturing, Inc. shall be shipped prepaid, and will be returned F.O.B. Lake Crystal, Minnesota.
- We will not assume responsibility for shipping, labor or travel expenses.
- The warranty is void if the product has been obviously abused, or subjected to other than normal usage.
- We reserve the right of make improvements without notice or obligation regarding models previously sold.

# ! CAUTION

- BODY MUST BE BRACED BEFORE SERVICING HOIST OR WORKING IN AREA WITH BODY IN RAISED POSITION
- LUBRICATE HOIST GREASE FITTINGS OFTEN – AT LEAST EACH TIME TRUCK IS SERVICED
- TRUCK MUST BE LEVEL FOR DUMPING
- DO NOT OVERLOAD

CRYSTEEL MFG, INC.

CRYSTEEL MANUFACTURING, INC.

P.O. BOX 178 LAKE CRYSTAL, MN 56055-0178

CRYSTEEL MFG 10.50 29.00 MAXIMUM 24.00 MINIMUM TOP OF TRUCK FRAME 21.00 -38.29 79.50 25.69 6.32 4.88

2.87

FRONT

